

WHAT IS CLAIMED IS:

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1. A gateway apparatus which interconnects a first network and a second network, comprising:

an encoding processing unit receiving voice data from the first network and generating encoded voice data from the received voice data;

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a packet processing unit creating packets of the encoded voice data from the encoding processing unit and transmitting the packets to the second network;

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a network-state estimation unit determining network-state information of the second network; and

a determination unit controlling at least one of the encoding of the encoding processing unit and the packetizing of the packet processing unit based on the network-state information determined by the network-state estimation unit.

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2. The gateway apparatus according to claim 1, wherein the determination unit determines a type of the encoding that is performed by the encoding processing unit, based on the network-state information of the second network.

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3. The gateway apparatus according to claim 1, wherein the determination unit determines an option of non-voiced data compression or non-compression that is performed by the encoding processing unit, based on the network-state information of the second network.

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4. The gateway apparatus according to claim 1, wherein the determination unit determines a packet discarding priority level of the packet processing unit, based on the network-state information of the second network.

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5. The gateway apparatus according to claim 1, wherein the determination unit determines a packet transmission priority level of the packet processing unit, based on the network-state information of the second network.

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6. The gateway apparatus according to claim 1, wherein the network-state estimation unit determines a packet loss ratio based on packets that are received from a second gateway apparatus via the second network, and sends the packet loss ratio to the determination unit.

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7. The gateway apparatus according to claim 6, wherein the determination unit stores at least one reference value of the packet loss ratio, and determines a specific one of a set of predetermined control parameter levels based on the result of comparison of said at least one reference value and the packet loss ratio received from the network-state estimation unit, the set of predetermined control parameter levels being inclusive of at least one of a set of packet discarding priority levels, a set of packet transmission priority levels, and a set of encoding type levels.

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8. The gateway apparatus according to claim 1, wherein the network-state estimation unit determines a packet arrival time jitter based on packets that are received from a second gateway apparatus via the second network, and sends the packet arrival time jitter to the determination unit.

9. The gateway apparatus according to claim 8, wherein the determination unit stores at least one reference value of the packet arrival time jitter, and determines a specific one of a set of predetermined control parameter levels based on the result of comparison of said at least one reference value and the packet arrival time jitter received from the network-state estimation unit, the set of predetermined control parameter levels being inclusive of at least one of a set of packet discarding priority levels, a set of packet transmission priority levels, and a set of encoding type levels.

10. The gateway apparatus according to claim 1, wherein the network-state estimation unit reads a TTL value from a packet that is received from a second gateway apparatus via the second network at a start of communication, the network-state estimation unit sending the TTL value to the determination unit.

11. The gateway apparatus according to claim 10, wherein determination unit stores at least one reference value of the TTL value, and determines a specific one of a set of predetermined control parameter levels based on the result of comparison of said at least one reference value and the TTL value received from the

network-state estimation unit, the set of predetermined control parameter levels being inclusive of at least one of a set of packet discarding priority levels, a set of packet transmission priority levels, and a set of encoding type levels.

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10 12. The gateway apparatus according to claim 1, further comprising a network-state storage unit storing the network-state information with respect to each of a plurality of destination stations in the second network, wherein the determination unit stores a reference value of one of a packet loss ratio and a packet arrival time jitter, and, when a call connection between the gateway
15 apparatus and one of the plurality of destination stations is established, the determination unit determines a specific one of a set of predetermined control parameter levels based on the result of comparison of the reference value and the network-state information of said one of the plurality of destination stations read
20 from the network-state storage unit.

25 13. The gateway apparatus according to claim 1, wherein the network-state estimation unit transmits test voice data to a second gateway apparatus via the second network, receives test packets from the second gateway apparatus via the second network, and determines the network-state information, including an estimated
30 network delay and an estimated voice data quality level, based on the result of comparison of the test voice data and the test packets.

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14. The gateway apparatus according to claim 13, wherein the network-state estimation unit compares a transmission time of the

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test voice data and a receiving time of the test packets, and calculates an estimated network delay of the second network based on the result of the comparison of the transmission time and the receiving time.

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10 15. The gateway apparatus according to claim 13, wherein the network-state estimation unit determines at least one of a packet loss ratio and a packet arrival time jitter of the second network based on the received test packets.

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20 16. The gateway apparatus according to claim 13, wherein the encoding processing unit receives the test voice data from the network-state estimation unit, and generates pulse-code-modulation encoded voice data from the received test voice data.

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17. A data transmission method which is performed by a gateway apparatus including an encoding processing unit and a packet processing unit and interconnecting a first network and a second network, the data transmission method comprising the steps of:

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causing the encoding processing unit to receive voice data from the first network and generate encoded voice data from the received voice data;

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causing the packet processing unit to create packets of the encoded voice data and transmit the packets to the second network;

determining network-state information of the second network; and

controlling at least one of the encoding of the encoding

processing unit and the packetizing of the packet processing unit based on the network-state information obtained in the generating step.

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